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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/602,468	06/23/2003	Venkat Selvamanickam	1014-SP156-US	2661

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EXAMINER	
AUSTIN, AARON	

ART UNIT	PAPER NUMBER
1784	

NOTIFICATION DATE	DELIVERY MODE
07/21/2011	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

mail@Abel-IP.com

Office Action Summary	Application No.	Applicant(s)	
	10/602,468	SELVAMANICKAM ET AL.	
	Examiner	Art Unit	
	AARON AUSTIN	1784	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *26 October 2010*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *23-34 and 36-43* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) *43* is/are allowed.

6)☒ Claim(s) *23-34 and 36-42* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *5/2/11*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Allowable Subject Matter

Claim 43 is allowed.

The following is an examiner's statement of reasons for allowance: the prior art of record does not teach or provide motivation to form a superconducting article comprising a composition of elements structurally related as set forth in claim(s) 43. Specifically, the prior art fails to teach first, second and third superconductive films bonded as claimed wherein one of the films includes YBCO and another $SmBa_2Cu_3O_7$.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 23-28, 31-34, and 40-42 are rejected under 35 U.S.C. 102(a) as being anticipated by Onabe et al. (EP 1271666).

Onabe et al. teach an oxide superconducting conductor comprising a substrate tape and overlying superconductor layer (paragraph [0029]). The superconductor layer is comprised of at least three superconductive films 22a-22c of the same material (Fig. 4A; paragraph [0087]). The films are atomically bonded and free of intervening layers (Fig. 4A; paragraph [0035]).

Regarding claims 24-27, the substrate may be comprised of nickel, a nickel alloy, or stainless steel (paragraph [0089]).

Regarding claim 28, the substrate may include an overlying layer which may be considered a buffer between the base metal and the oxide superconducting layers (paragraphs [0085] and [0088]).

Regarding claims 31-34, the superconductive layer is comprised of a high temperature rare-earth oxide such as YBCO or Sm123 (paragraph [0087]).

Regarding claim 40, an exemplary thickness of 0.5 microns is provided for the superconductive layer such that each of the three layers forming the superconductor layer does not have a thickness of 1.5 microns (paragraph [0199], Table 10).

Regarding claim 41, as like materials are used in a like manner to the claims, the current density capacity is expected to be as claimed.

Regarding claim 42, the critical current density (Jc) is greater than 0.6MA/cm^2 (Table 10).

Claims 23-25, 27-34, 36, and 38-42 are rejected under 35 U.S.C. 102(e) as being anticipated by Zhang et al. (US 6,669,774).

Zhang et al. teach a multi-layer article comprising a substrate tape and overlying superconductive layer (column 19, lines 36-64). The superconductive layer is comprised of at least three superconductive films of the same superconductor material (column 19, lines 50-64). The layers are atomically bonded and free of intervening layers (Fig. 3; column 19, lines 36-64).

Regarding claims 24-25 and 27, the substrate may be comprised of nickel or a nickel alloy (column 10, lines 11-58).

Regarding claim 28, the substrate may include a buffer between the base metal and the oxide superconducting layers (column 11, lines 16-20; column 12, lines 44-58).

Regarding claim 29, the buffer layer may have a bi-axial texture (column 3, lines 55-57).

Regarding claim 30, the buffer layer may comprise YSZ (column 12, lines 44-58).

Regarding claims 31-34, the superconductive layer is comprised of a high temperature rare-earth-metal-barium-copper-oxide such as YBCO or Sm123 (column 12, lines 12-17).

Regarding claim 36, the superconductive layer may be comprised of four or more superconductive films (column 19, lines 50-64).

Regarding claims 38-40 and 43, the superconductive layer has a thickness of about 1 to 10 microns (column 19, lines 36-45).

Regarding claim 41, as like materials are used in a like manner to the claims, the current density capacity is expected to be as claimed.

Regarding claim 42, the critical current density is greater than 0.6MA/cm^2 (column 12, lines 30-37).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claim 26 is rejected under 35 U.S.C. 103(a) as being unpatentable over Zhang et al. (US 6,669,774) in view of Onabe et al. (EP 1271666).

Zhang et al. teach a multi-layer article comprising a substrate tape and overlying superconductive layer as described above.

Zhang et al. do not teach the substrate tape as comprising stainless steel.

Onabe et al. teach an oxide superconducting conductor comprising a substrate tape and overlying superconductor layer (paragraph [0029]). The superconductor layer is comprised of at least three superconductive films 22a-22c of the same material (Fig. 4A; paragraph [0087]). The films are atomically bonded and free of intervening layers (Fig. 4A; paragraph [0035]). The substrate may be comprised of materials having superior high temperature strength such as nickel, a nickel alloy, or stainless steel (paragraph [0089]). Therefore, as Onabe et al. clearly teach stainless steel is

functionally equivalent in providing a substrate tape having superior high temperature strength for multilayer superconductive films, it would have been obvious to one of ordinary skill in the art at the time of the claimed invention to use stainless steel as the substrate metal of Zhang et al. Thus the claimed invention as a whole is *prima facie* obvious over the combined teachings of the prior art.

Claim 37 is rejected under 35 U.S.C. 103(a) as being unpatentable over Zhang et al. (US 6,669,774) in view of Nagaya Shigeo (JP 2003-36744).

Zhang et al. teach a multi-layer article comprising a substrate tape and overlying superconductive layer as described above.

Zhang et al. do not teach at least two of the superconductive films in direct contact with each other having different thicknesses.

However, it would have been obvious to one having ordinary skill in the art at the time of the invention to adjust the thickness for the intended application, since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980). In the present case, the thickness of the layers directly impacts the current capacity and current density capability of the article by providing an avenue for the current to pass. Thus the thickness of the layers is a result effective variable.

Furthermore, Nagaya teaches forming a plurality of oxide superconductor layers on a tape-shaped base material. Each layer thickness of the laminated oxide superconductor is individually selected between 0.1 and 0.4 microns. Therefore, as

Nagaya et al. clearly teach the thickness of individual superconductive layers in contact with each other may be selected separately to achieve a high critical current, it would have been obvious to one of ordinary skill in the art at the time of the claimed invention to form at least two of the superconductive films in direct contact with each other having different thicknesses. Thus the claimed invention as a whole is *prima facie* obvious over the combined teachings of the prior art.

Claim 37 is rejected under 35 U.S.C. 103(a) as being unpatentable over Onabe et al. (EP 1271666) in view of Nagaya Shigeo (JP 2003-36744).

Onabe et al. teach an oxide superconducting conductor comprising a substrate tape and overlying superconductor layer as described above.

Onabe et al. do not teach at least two of the superconductive films in direct contact with each other having different thicknesses.

However, it would have been obvious to one having ordinary skill in the art at the time of the invention to adjust the thickness for the intended application, since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980). In the present case, the thickness of the layers directly impacts the current capacity and current density capability of the article by providing an avenue for the current to pass. Thus the thickness of the layers is a result effective variable discoverable by one of ordinary skill in the art.

Furthermore, Nagaya teaches forming a plurality of oxide superconductor layers on a tape-shaped base material. Each layer thickness of the laminated oxide superconductor is individually selected between 0.1 and 0.4 microns. Therefore, as Nagaya et al. clearly teach the thickness of individual superconductive layers in contact with each other may be selected separately to achieve a high critical current, it would have been obvious to one of ordinary skill in the art at the time of the claimed invention to form at least two of the superconductive films in direct contact with each other having different thicknesses. Thus the claimed invention as a whole is *prima facie* obvious over the combined teachings of the prior art.

Response to Arguments

Applicant's arguments filed 5/10/11 have been fully considered but they are not persuasive.

In particular, Applicant argues with respect to both the Onabe and Zhang references that atomic bonding is not present as the layers are deposited as discrete layers.

With respect to the Onabe reference, paragraph [0035] discloses the layers are formed by CVD. This process is expected to form atomic bonds between layers in the same manner MOCVD forms such bonds (see Applicant's specification). One of ordinary skill in the art would recognize the CVD process induces reaction between the vapor and the substrate such that atomic bonding occurs to bind the layers together.

As for the Zhang reference, Applicant has argued the intermediate layers are produced by electron beam evaporation or magnetron sputtering, both types of PVD, result in discrete layers that do not include atomic bonding as claimed. However, it is not clear as to where Zhang teaches electron beam evaporation or magnetron sputtering for layers other than the buffer layers (column 20, lines 1-10 relate to buffer layers rather than the superconductive films formed thereon). In the present case, formation of the superconducting layers is conducted from precursor materials in a solid-state or semi-solid state (column 17, lines 64-column 18, line 3). These precursors may be applied by evaporation (of which PVD is an example) or from elemental sources (such as from a salt solution). See column 18 lines 4-63. Thus a number of methods may be used to apply the superconductive layers (column 19, lines 36-45). Atomic bonding includes metallic, ionic, covalent, and van der Waals bonds by definition. At the very least, van der Waals forces (a type of atomic bond) is expected between layers formed by any of these methods. Alternatively, other atomic bonding methods are disclosed such as through use of the cationic charged species in a salt solution to generate ionic bonds (column 19, lines 30-35). Thus there are methods disclosed for forming the superconductive layers that do generate atomic bonds between the layers as claimed. For this reason Applicant's arguments are unconvincing.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to AARON AUSTIN whose telephone number is (571)272-8935. The examiner can normally be reached on Monday-Friday: 7:30 AM to 4:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jennifer McNeil can be reached on (571) 272-1540. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Aaron S Austin/
Primary Examiner, Art Unit 1784